

Onshore elevation data from California Coastal Conservancy (available at <http://www.ccc.ca.gov/csp/cspdata/cspdata/cspdata.html>) and from U.S. Geological Survey's National Elevation Dataset (available at <http://ned.usgs.gov/>). Offshore shaded-relief bathymetry from map area sheet 2, the near-shore California State Waters limit from NOAA Office of Coast Survey Universal Transverse Mercator projection, Zone 10N.

NOT INTENDED FOR NAVIGATIONAL USE

PROPOSED 1:5000 SCALE  
NAD 83  
UTM 10N  
WGS 84

SCALE 1:24,000  
0 1000 2000 3000 4000 5000 6000 7000 FEET  
0 1 2 3 4 5 6 7 8 9 10 KILOMETERS  
BATHYMETRIC CONTOUR INTERVAL: 10 METERS  
ONE MILE = 1.609 NAUTICAL MILES

MAP LOCATION  
CALIF.

Seabed character mapped in 2012. Bathymetric contours by Mercedes D. Erdey, 2013. US database and digital cartography by Mercedes D. Erdey and Robert L. Solten. Manuscript approved for publication July 21, 2015.



**DISCUSSION**

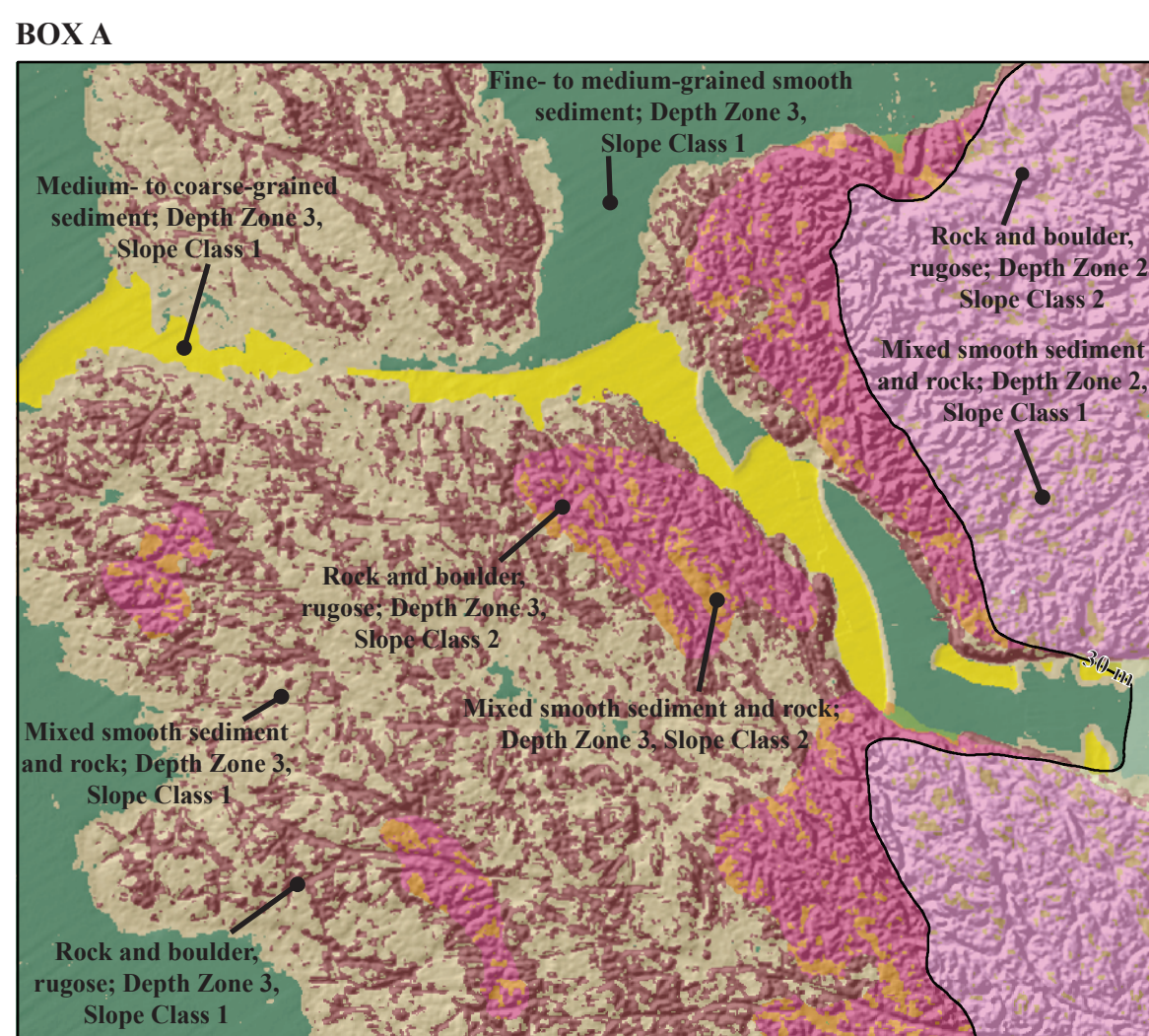
This seafloor-character map of the Offshore of Bodega Head map area in northern California was produced using video-supervised, maximum-likelihood classification of the bathymetry and backscatter (intensity of return) signals from sonar systems (a summary of the video data collected for the purpose of supervising the classification is shown on sheet 6). Rugosity (a GIS-derived characterization of roughness) and backscatter intensity were used as variants in the classification. The interpreted classifications were then draped over shaded-relief bathymetry (see sheet 2).

The substrate classes mapped in this area have been divided into the following California Marine Life Protection Act depth zones: Depth Zone 2 (interstitial to 30 m), and Depth Zone 3 (30 to 100 m). In addition, the following slope classes are represented on this map (Coastal and Marine Ecological Classification Standard slope zones are shown in parentheses): Slope Class 1, 0° to 5° (flat); and Slope Class 2, 5° to 30° (steep). Depth Zone 1 (interstitial), Depth Zones 4 and 5 (greater than 100 m), and Slope Classes 3 to 5, greater than 30° (steeply sloping to overhanging) are not present in this map area.

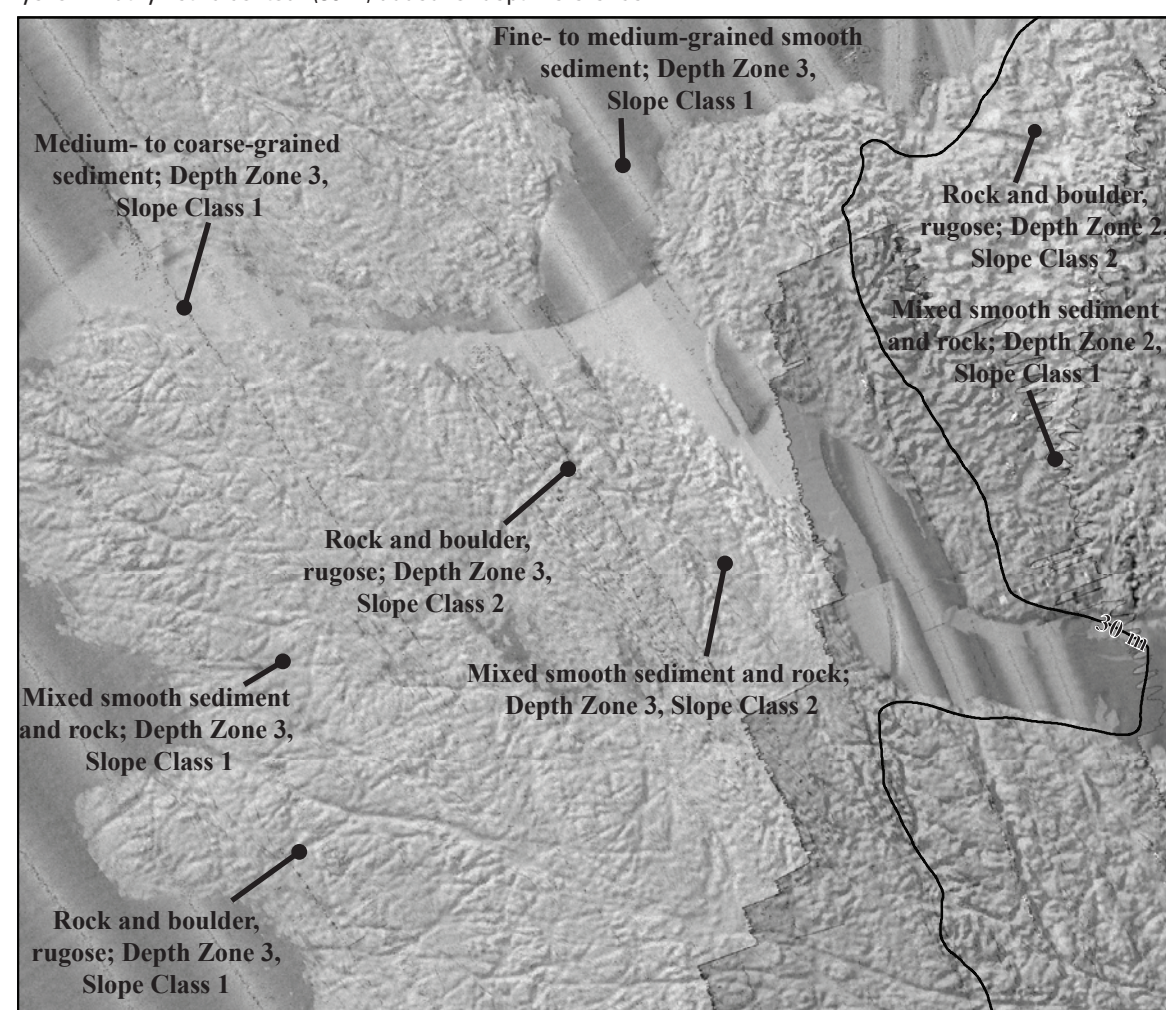
Fine- to medium-grained smooth sediment (sand and mud) makes up 69.3 percent (96.2 km<sup>2</sup>) of the map area; 22.7 percent (31.5 km<sup>2</sup>) is in Depth Zone 2, and 46.6 percent (64.7 km<sup>2</sup>) is in Depth Zone 3. Mixed smooth sediment

**Table 1. Coverage of classified seafloor, in square kilometers (sq km) and percent of total area, broken into California Marine Life Protection Act Depth Zones 2 and 3.**

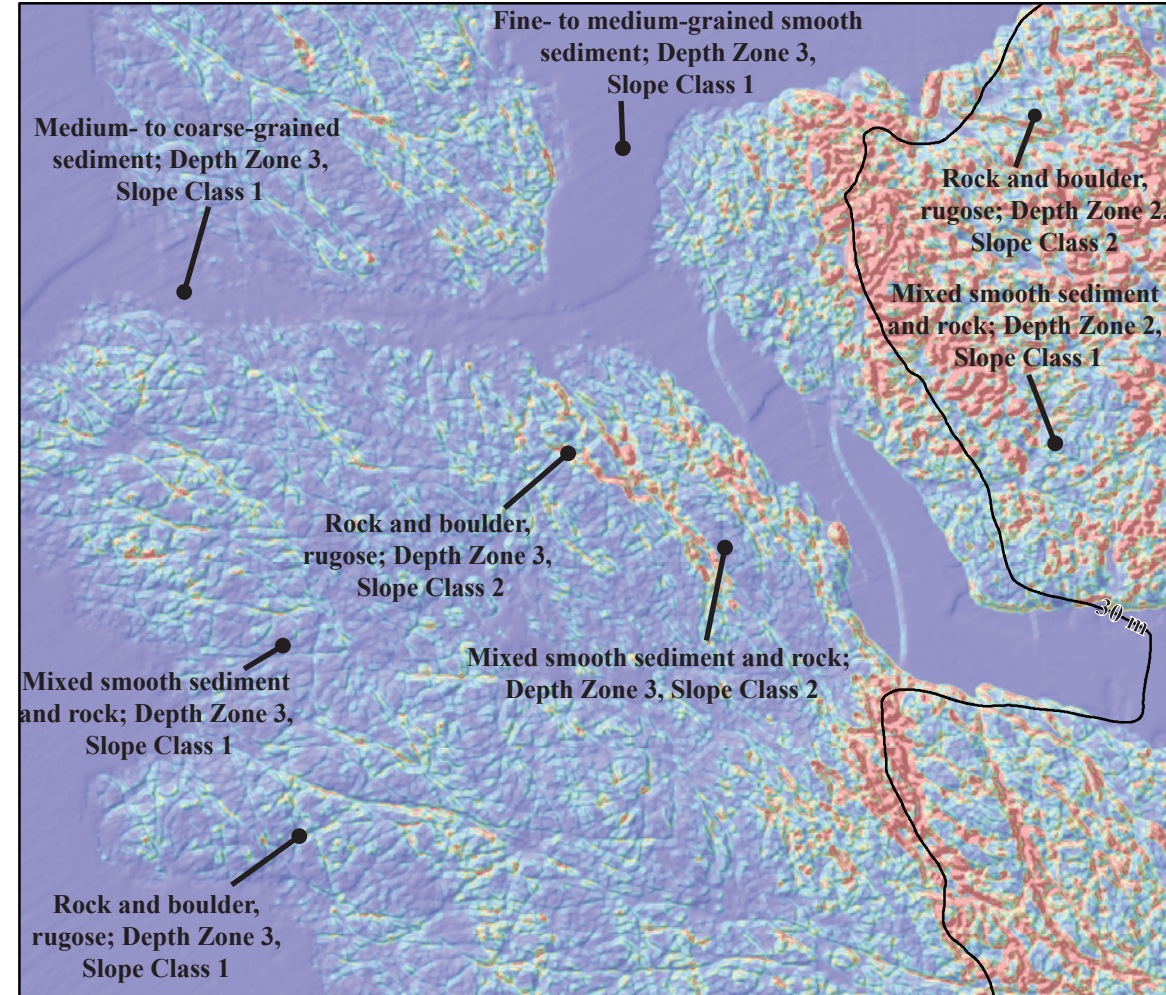
	Total	Depth Zone 2 (water depth 0–30 m)	Depth Zone 3 (water depth 30–100 m)
	percent	sq km	percent of total
Fine- to medium-grained smooth sediment	69.3	96.2	22.7
Mixed smooth sediment and rock	13.5	18.7	4.2
Rock and boulder, rugose	15.2	21.2	8.6
Medium- to coarse-grained sediment	2.0	2.7	1.2



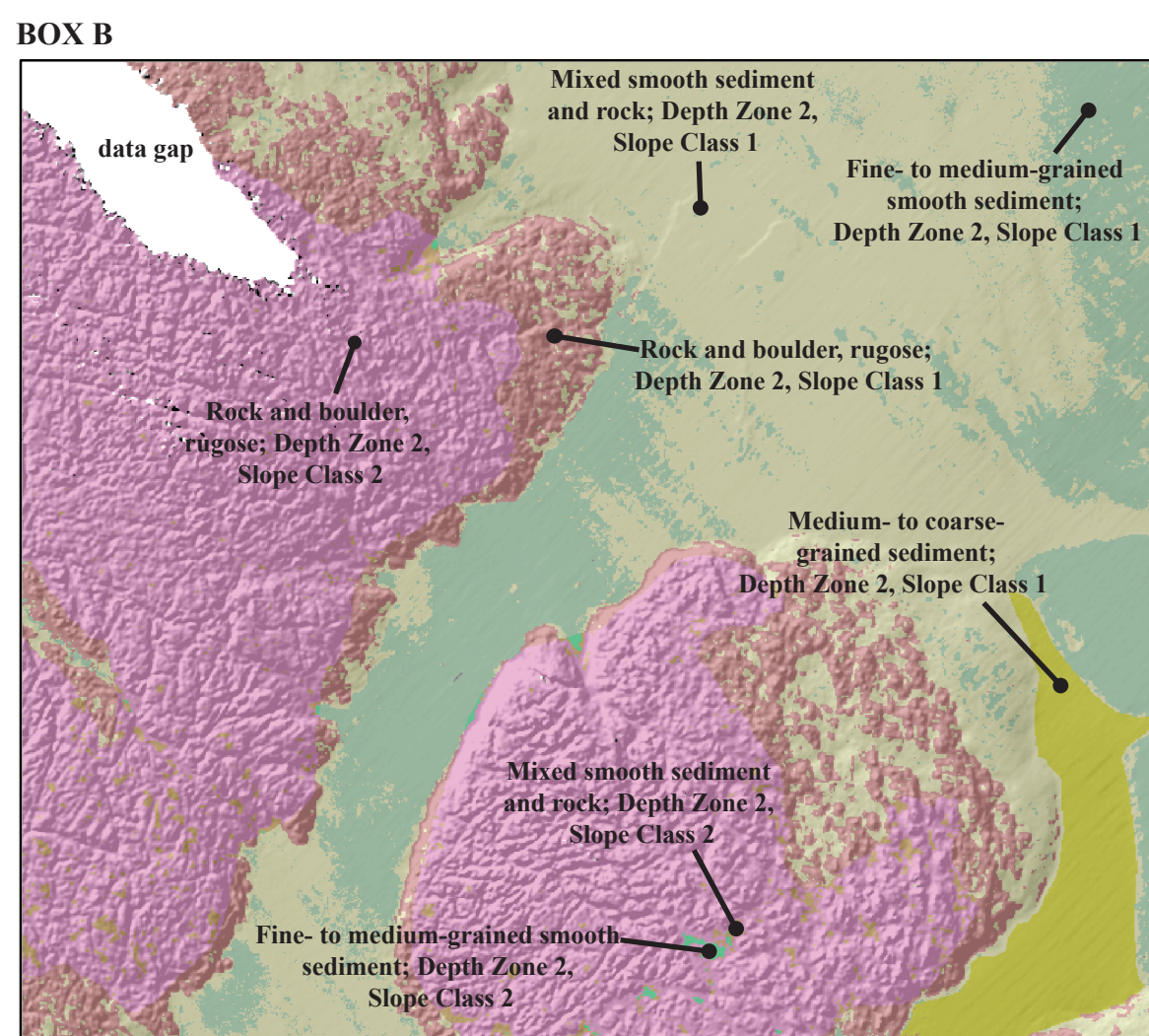
**Figure 1.** Detailed view of substrate classes mapped northwest of Bodega Head (see Box A, on map, for location). Depth Zone 2 (interstitial to 30 m), Depth Zone 3 (30 to 100 m). Slope Class 1 (0°–5°), and Slope Class 2 (5°–30°). Fine- to medium-grained smooth sediment is shown in shades of green; mixed smooth sediment and rock is shown in shades of tan; rock is shown in shades of pink; and medium- to coarse-grained sediment is shown in shades of yellow. Bathymetric contour (30 m) added for depth reference.



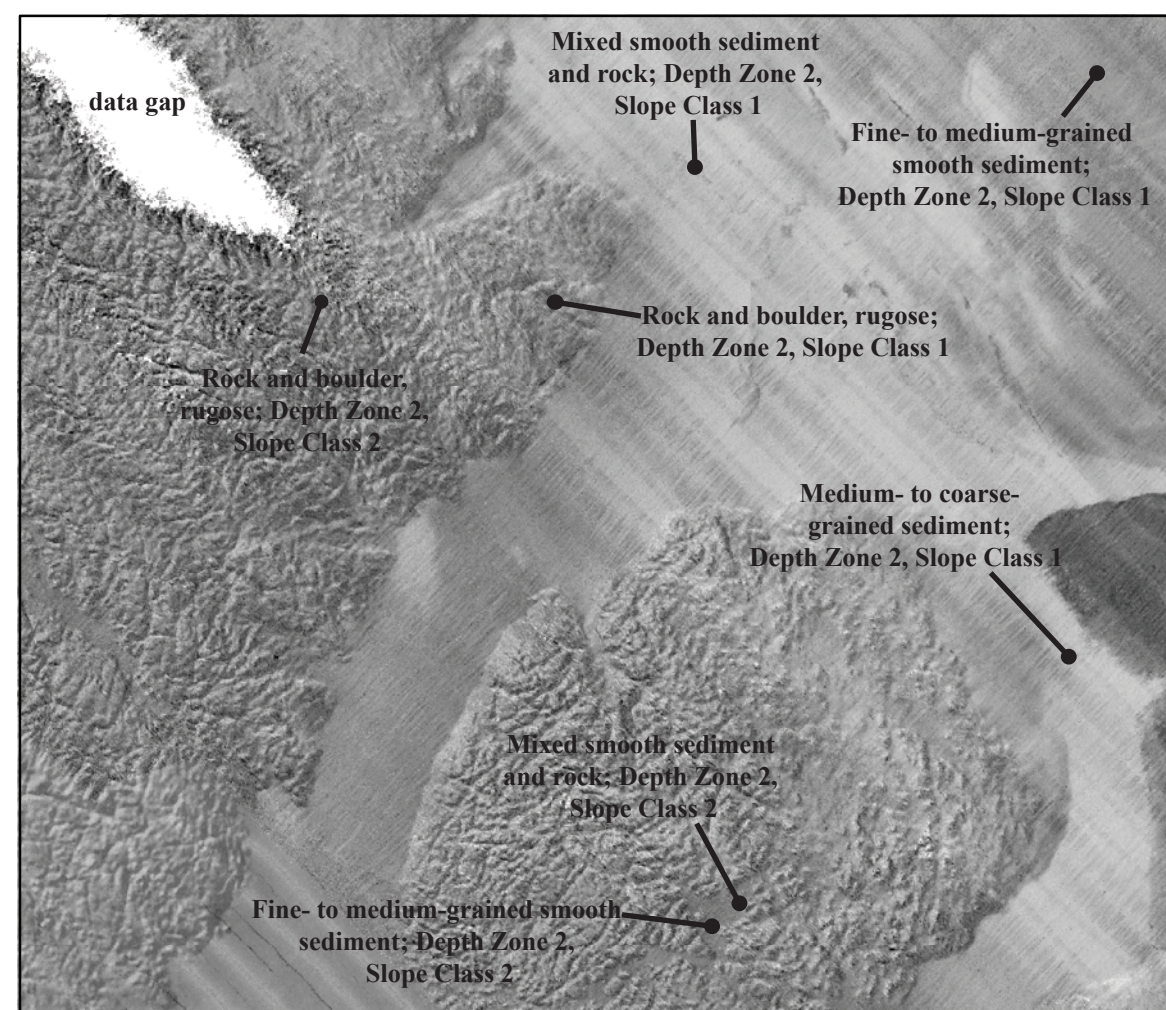
**Figure 2.** Acoustic backscatter image (see sheet 3) draped over shaded-relief bathymetry (see sheet 2) for same area as Figure 1 (Box A on map). Brighter areas indicate coarse-grained, rough, or hard seafloor; darker areas indicate unconsolidated (loosely packed) sediment. Parallel light-gray lines and series of short dark-gray dashes are data-processing artifacts. Interpreted substrate classes from Figure 1 included for comparison.



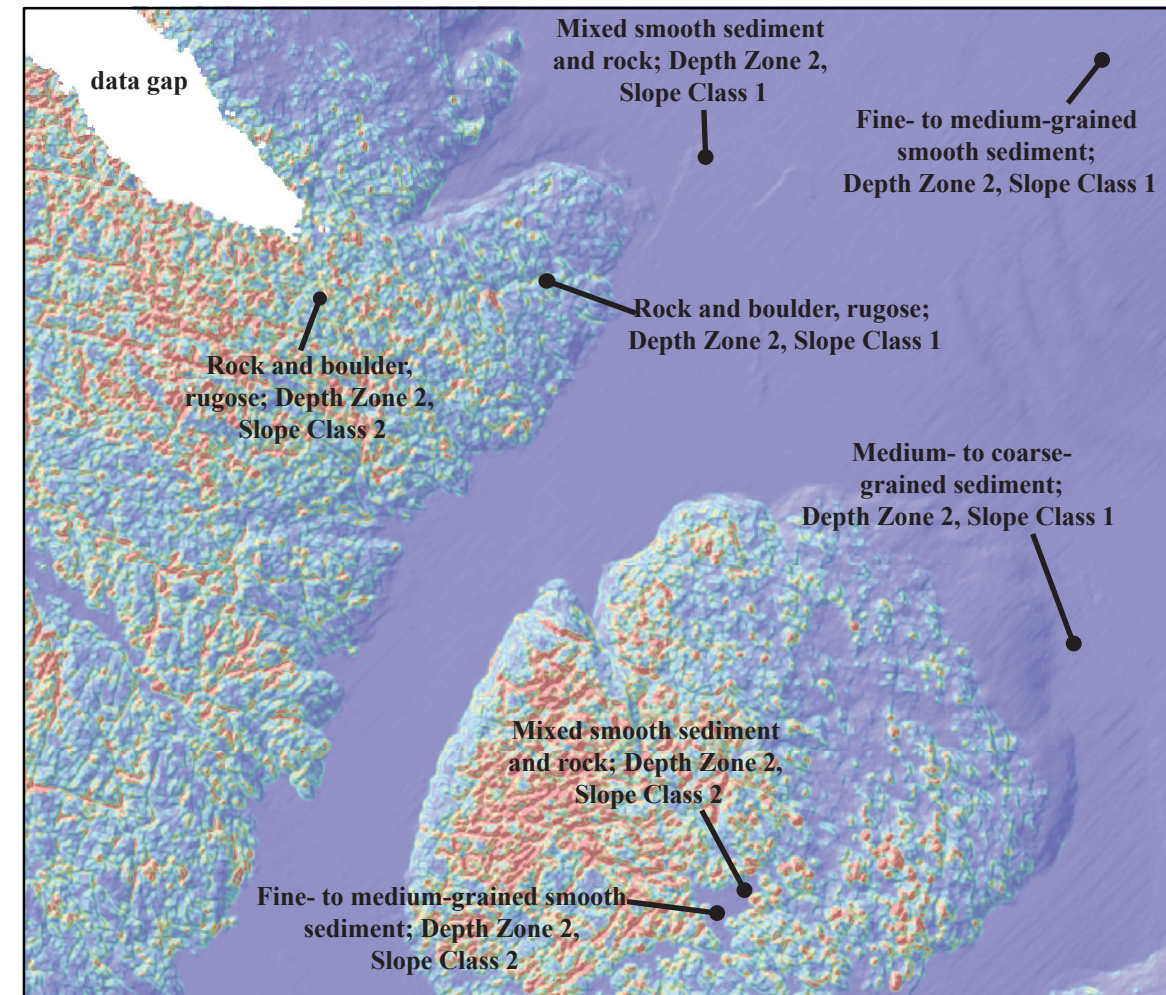
**Figure 3.** Rugosity characterization of roughness derived from bathymetry draped over shaded-relief bathymetry (see sheet 2) for same area as Figure 1 (Box A on map). Rugosity values are displayed in muted "rainbow" color spectrum that ranges from purple (low rugosity) through green (medium rugosity) to red (high rugosity). Interpreted substrate classes from Figure 1 included for comparison.



**Figure 4.** Detailed view of substrate classes mapped southeast of Bodega Head (see Box B, on map, for location). Depth Zone 2 (interstitial to 30 m), Depth Zone 3 (30 to 100 m). Slope Class 1 (0°–5°), and Slope Class 2 (5°–30°). Fine- to medium-grained smooth sediment is shown in shades of green; mixed smooth sediment and rock is shown in shades of tan; rock is shown in shades of pink; and medium- to coarse-grained sediment is shown in shades of yellow.



**Figure 5.** Acoustic backscatter image (see sheet 3) draped over shaded-relief bathymetry (see sheet 2) for same area as Figure 4 (Box B on map). Brighter areas indicate coarse-grained, rough, or hard seafloor; darker areas indicate unconsolidated (loosely packed) sediment. Parallel light- and dark-gray lines are data-processing artifacts. Interpreted substrate classes from Figure 4 included for comparison.



**Figure 6.** Rugosity characterization of roughness derived from bathymetry draped over shaded-relief bathymetry (see sheet 2) for same area as Figure 4 (Box B on map). Rugosity values are displayed in muted "rainbow" color spectrum that ranges from purple (low rugosity) through green (medium rugosity) to red (high rugosity). Interpreted substrate classes from Figure 4 included for comparison.

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